Policy and implementation strategies for the education of

gifted and talented students

Revised 2004

Curriculum differentiation

NEW SOUTH WALES
DEPARTMENT
OF EDUCATION
AND TRAINING

Policy and implementation strategies for the education of

gifted and talented students

Support package

Curriculum differentiation

ISBN: 0731383427

SCIS: 1175498

Contents

Foreword

This document is an introduction to curriculum differentiation for gifted and talented students and needs to be read in conjunction with the New South Wales *Policy and implementation strategies for gifted and talented students* (revised 2004a) and the companion document *Guidelines for the use of strategies to support gifted and talented students* (2004b). The information provided is suitable for all stages of schooling and is applicable for extension programs starting in comprehensive high schools in 2005.

Additional support materials are available at the Gifted and Talented web site at **http://www.curriculumsupport.nsw.edu.au/gats/index.cfm**

Key

The following icons designate a range of resources and activities that include:

Reading material such as policies, documentation, publications and articles supporting the particular aspects of differentiation under discussion

Electronically available material, including Internet sites and *PowerPoint* presentations

Sample units of work and examples of strategies for supporting students.

Acknowledgements

We thank the following for their contributions to the differentiation support package:

Ms Stephanie Dempsey	Chatswood High School
Mr Peter Heath	Sydney Technical High School, Bexley
Dr Katherine Hoekman	University of New South Wales
Ms Shan Krauth	Beecroft Public School
Mr Colin McAuliffe	Baulkham Hills High School
Mr Paul Owens	Sydney Technical High School, Bexley
Dr Rosie Wade	Illaroo Road Public School
Ms Jo Wright	Sydney Technical High School, Bexley
Ms Sally Wybenga	Chatswood High School

Differentiation: How to cater for gifted students

Differentiation is a difficult concept to define precisely. It relates to understanding individual differences and devising institutional strategies to cater for students' needs. For differentiation to thrive, appropriate strategies must be systematically implemented at both the school and classroom levels (Robinson, 2002).

Differentiation at the school level

Each school has a distinctive culture that reflects the focus and priorities of the executive and teaching staff. Differentiation for the gifted and talented student is more likely to happen where the school leadership emphasises giftedness as part of educational provision. Robinson (2002) observes that this is evident where principals display a detailed knowledge of educational opportunities for their gifted students, high expectations for student achievement and recognition for teachers' efforts in curriculum differentiation.

Schools also indicate a commitment to educational services for gifted and talented students if they have a gifted and talented co-ordinator and a policy that outlines:

- the definitions of giftedness and talent
- the intellectual, social and emotional needs of gifted students
- the services that the school intends to offer.

(For information about what to include in a school policy see Appendix A.)

A flexible school that provides choice for students is also beneficial for gifted learners. Commitment to flexibility in provision needs to go beyond the efforts of the classroom teacher and be the shared responsibility of the school leadership. Choice for gifted and talented students involves free access to technology and learning spaces, and extra time to pursue tasks or to research a topic of interest independently. Differentiated choices can be provided through accelerated progression, for example by compacting the curriculum or allowing a student to undertake intellectual challenges designed for older students.

Differentiation at the classroom level

Differentiation is evident at the classroom level when appropriate challenges are available for all students. Curriculum can be adapted in content, process and product to provide developmentally appropriate opportunities. The evaluation of curriculum materials for suitability is a complex task. It requires an understanding of the relationships between curriculum, instruction and assessment.

This package explores the nature of differentiated instruction and shows how to develop and evaluate programs for gifted and talented students.

Definition

A shared understanding of giftedness is important in the establishment of programs for gifted students. Gagné's (2003) *Differentiated Model of Giftedness and Talent* (DMGT) has been adopted in the revised policy because it is internationally recognised for its strong research base and accessibility to teachers. It has a direct

and logical connection to identification and curriculum development. An important feature of the model is that it acknowledges the gifted underachiever.

> ***Gifted students*** *are those whose* ***potential*** is distinctly above average in one or more of the following domains of human ability: intellectual, creative, social and physical to a degree that places an individual at least among the top 10% of age peers.
>
> ***Talented students*** are those whose skills are distinctly above average in one or more areas of human ***performance*** to a degree that places an individual at least among the top 10% of age peers who are or have been active in that field or fields.
>
> (Adapted from Gagné, 2003)

The DMGT has six components: domains of natural abilities, talent fields, intra-personal catalysts (IC), environmental catalysts (EC), learning/practice (LP) and chance (CH). The translation of giftedness into talent results from application to appropriate opportunities for learning, training and practice. Thus effort is a key ingredient that enables potential to become exemplary performance.

Gagné (2003) distinguishes two types of catalysts that may facilitate or hinder the translation of gifts into talent: intra-personal and environmental. Psychological factors in the intra-personal category include motivation, volition, self-management and personality traits. A distinction is made between motivation (interests, needs, intrinsic/extrinsic motivation) and volition (effort, perseverance, self-control, regular monitoring). These factors are important in maintaining effort in the face of obstacles and frustrations. Personality characteristics include self-awareness, adaptability and self-esteem.

The four main groups of environmental catalysts are persons, milieu or context, provisions, and events. Parents, peers, teachers and mentors are key persons. Context can be considered at the macroscopic level (geographic, demographic, sociological) and the microscopic level (family size, socio-economic status, neighbourhood services). Since schools in New South Wales vary markedly in geographic location, size, student population and nature of teaching staff, the circumstances of individual students must be considered. Events can also have a profound influence on the development of talent. For example, the opportunity to work with a mentor in an area of deep interest can have far-reaching effects. Thus individual talent develops through a complex interplay of factors, and outcomes for gifted students will be enhanced if these are understood.

A more detailed discussion of Gagné's DMGT can be accessed at
http://www.curriculumsupport.nsw.edu.au/gats/index.cfm

Degrees of potential

Many educators assume that the gifted are a homogeneous group, which can result in misidentification, inadequate curriculum provision and incorrect grade placement (Gross, 2000). In reality, gifted and talented students are diverse, both in the nature of their abilities and in their levels of giftedness. The intelligence quotient (IQ), which can be derived from various psychometric tests, provides a useful if somewhat simplistic taxonomy of the levels of giftedness. IQ tests profile a student's strengths

and weaknesses and can reveal discrepancies between chronological and mental age. Table 1 illustrates a classification of levels of giftedness and indicates the frequency with which children with particular IQs are found in the general population. Children with an IQ in the gifted range are likely to be adept at many cognitive tasks (Gross, 2000).

Table 1: IQ and levels of giftedness

Level of giftedness	IQ range	Prevalence
Mildly	115 – 129	> 1:40
Moderately	130 – 144	1:40 – 1:1000
Highly	145 – 159	1:1000 – 1: 10 000
Exceptionally	160 – 179	1:10 000 – 1:1 million
Profoundly	180 +	< 1:1 million

(Feldhusen, 1993, cited in Gross, 2000)

Different educational responses are required for students depending on their level of giftedness. Differentiation of the curriculum may be the only adjustment required for mildly and moderately gifted students, but the more highly gifted may require a more individualised approach.

Recent research has shown that effective teachers of the gifted understand the nature and needs of gifted students. They have insight into the behaviour of gifted students who are bored and under-challenged (Croft, 2003). Important components of teachers' craft knowledge in gifted education include the recognition of students who require a more challenging curriculum, the development of appropriate programs for them and the use of effective teaching strategies (Croft, 2003).

Programming for gifted students

Curriculum for gifted learners has been guided by certain beliefs which include the following:

- The needs of gifted learners encompass cognitive, affective, social, and aesthetic areas of curriculum experiences.
- Gifted students are best served by a curriculum that incorporates both accelerated and enriched learning.
- Curriculum experiences for gifted learners need to be thoughtfully planned, written down and incorporate explicit assessment.

(Van Tassel-Baska, 2003)

Opportunities for gifted students can include a variety of individual or group interventions specifically targeted at talent development (Gagné, 2003). Gifted educational opportunities are generally divided into three areas: enrichment, acceleration and grouping. Unfortunately, this has often been interpreted to mean that acceleration practices are not enriching, which is not the case. Neither are these provisions mutually exclusive (Gagné, 2003).

In programs for gifted students, grouping and accelerative practices are interdependent and strongly supported by research as central to maximising learning outcomes for gifted students. A combination of practices, including acceleration, grouping and differentiation of the curriculum, allow gifted students access to meaningful learning

opportunities. Substantial gains in learning can be made when gifted students are grouped together and when they are accelerated, but this can be achieved only if they have access to a developmentally appropriate curriculum (Rogers, 2002).

The curriculum and instructional strategies form the cornerstone of programs for gifted and talented students (Table 2). A program is a "comprehensive, sequential system for educating students with identifiable needs" (Berger, 1991). Programs are permanent and well-designed sequences of goals, strategies and content, in contrast to provisions, which are "fragmentary, short-term and an adjunct to the core curriculum" (Berger, 1991). Provisions for gifted students can be important components of a program but short term, *ad hoc* and fragmented provisions that are not connected to the core curriculum should never be considered a valid substitute for a comprehensive program (Tannenbaum, 1983).

(See Appendix B for a list of possible program goals for a gifted class.)

Table 2: Defining curriculum and instruction

Term	Definition
Curriculum	Content that a teacher plans to teach, or outcomes that need to be achieved, as prescribed by the NSW Board of Studies (BOS)
Instruction	How the curriculum will be taught. Components of instruction include: 1. management (how the students will be organised) 2. delivery (the forms of the instruction) 3. process modifications (how the teacher will teach and the students will learn).

(Rogers, 2002)

Instructional management

Management decisions include the method of grouping students for instruction. Individualisation is one form of instructional management to consider to determine how either an individual or a group or class can proceed through the curriculum (Table 3).

Table 3: Examples of instructional management: individualisation

Individualisation	
Individual educational plan	A written plan for managing and delivering the curriculum for an exceptional child
Talent development	Provision of opportunities for a high-ability or talented student, through either individual work or work in a like-ability group
Individual mentoring or tutoring	An opportunity to engage intellectually in an area of deep interest with an expert
Independent study	Structured projects that enable a student to investigate individually an area of interest
Non-graded/ continuous progress classes	Placement of students in a class independent of age or grade, enabling progression through the curriculum at an appropriate pace
Multi-grade or multi-age classes	Combining two or three grade levels into one classroom and placing the brightest children as the youngest children in the classroom

(Rogers, 2002)

A second form of instructional management is grouping by ability or achievement level so that an appropriate curriculum can be provided for each group (Table 4).

Table 4: Examples of instructional management: grouping

Grouping by ability or achievement (Students of high ability or high achievement levels are put into a separate group for differentiating their instruction. Can be full or part-time, permanent or flexible sorting)	
Full-time ability grouping	Students are placed in selective schools or full-time, selected extension classes.
Multi-age classroom	Students are grouped by their achievement level in a subject rather than by grade or age level.
Regrouping by achievement for subject instruction	Students are sorted into different classes according to their subject ability or achievement, resulting in flexible sorting of students within the school to match curriculum with student level.
A cluster-grouped class	The top 5–8 high ability students are placed in the same class where they have access to a differentiated curriculum.
Within-class performance grouping	Students are sorted by topic or subject to provide differentiated learning for each group.
Co-operative grouping with like-ability learners	Groups of learners are organised in three- to four-member teams and the group task is adjusted accordingly.
A pull-out (withdrawal) program for children gifted in a specific subject area	Students are withdrawn from class regularly.

(Rogers, 2002)

For more information about types of acceleration and their relationship to the curriculum consult the acceleration package available at **http://www.curriculumsupport.nsw.edu.au/gats/index.cfm**

What is curriculum differentiation?

Differentiation ranges from slight to major modifications of the curriculum through adjustments to content, processes and skills. It provides a planned, documented and challenging curriculum that matches the ability of gifted students to:

- learn at faster rates
- find, solve and act on problems more readily
- manipulate abstract ideas and make connections to an advanced degree.

Differentiation should include enrichment and extension activities. Enrichment refers to the **broadening** of the curriculum to develop knowledge, application, thinking skills and attitudes, to a degree of complexity appropriate to the students' developmental level (Braggett, 1997). Enrichment activities are often found only in

extra-curricular provisions and need to be written into programs to ensure all students have access. Extension activities involve the **deepening** of students' knowledge, understanding and skills. These concepts are consistent with the elements of good practice, as described in *Quality teaching in NSW public schools: Discussion paper* (NSW Department of Education and Training, 2003).

A differentiated curriculum is a program of activities that offers a variety of entry points for students who differ in abilities, knowledge and skills. In a differentiated curriculum, teachers offer different approaches to *what students learn* (content), *how students learn* (process) and *how students demonstrate what they have learned* (product). Differentiated instruction is a mix of whole-class, group and individualised activities.

Table 5: Differentiated programming

Differentiated programming is:	Differentiated programming is not:
• having high expectations for each student • permitting students to demonstrate mastery of material they already know and to progress at their own pace through new material • providing different avenues to acquiring content, to processing or making sense of ideas, and to developing products • providing multiple assignments within each unit, tailored for students with differing levels of achievement • allowing students to choose, with the teacher's guidance, ways to learn and how to demonstrate what they have learned • flexible: teachers move students in and out of groups, based on students' instructional needs	• individualised instruction; it is not a different lesson plan for each student each day • assigning more work at the same level to high-achieving students • all the time; often it is important for students to work as a whole class • using only the differences in student responses to the same class assignment to provide differentiation • giving a normal assignment to most students and a different one to advanced learners • limited to subject acceleration; teachers are encouraged to use a variety of strategies

(Adapted from Tomlinson & Allan, 2000)

Curriculum planning

This should start with a decision about the core outcomes that all students need to achieve. Questions in relation to outcomes include the following:

- What will students be able to do at the end of the learning activity?
- What knowledge, comprehension and skills will they acquire?
- What attitudes and values will they learn?

In relation to content:

- What content should be selected for students to achieve the outcome?
- What are the sources, value and validity of the content?
- What methods of inquiry should be used to develop understanding?

In relation to processes:

- What teaching strategies are best suited to this type of learning?
- Do students have the necessary knowledge, skills and attitudes to benefit from particular teaching strategies?
- How can students' prior knowledge be used to enhance achievement?
- What kind of student assessment should be employed?

A diagnosis of the extent to which learning outcomes have already been achieved is required to cater for individual students.

Pre-testing

The creation of a differentiated curriculum requires some pre-planning. It is important to find out what the students already know and their level of skill attainment. Students' prior knowledge of core outcomes can be determined in different ways: for example, brainstorming or producing a concept map or a series of questions on a test. These types of pre-tests can provide valuable information about individual differences in ability within the class. The curriculum can then be compacted to delete outcomes that have already been achieved. The information from pre-testing can be used to modify or differentiate core outcomes by incorporating higher-order thinking skills into the program. Differentiation of the outcomes will enable provision for students who can not only demonstrate minimal competency but achieve outcomes at a highly developed level.

A useful tool to modify outcomes to make provision for gifted students is Bloom's taxonomy (Bloom, 1956).

Taxonomies of learning

Outcomes can be grouped into three domains:

1. cognitive and creative domains (concerned with mental processes)
2. psychomotor domain (concerned with body movement and physical actions)
3. affective domain (concerned with feelings, attitudes and values).

These broad domains of outcomes provide a focus for developing units of work. Bloom (1956) provided a useful taxonomy of learning for outcomes in the cognitive domain and many are familiar with Bloom's taxonomy. There are numerous curriculum models available to teachers and the purpose of these support materials is to inform teachers about this variety. Curriculum models need to be considered in relation to syllabus outcomes and appropriate use of teaching strategies.

Questioning techniques

Questions can conveniently be classified as open or closed and of low or higher order. For example, suppose students are investigating Australian history and in particular the exploration of the Australian coastline. You want to develop their ability to discuss and reason. Open questions are used to promote discussion or provide extended responses, and typically begin with "why" or "how", for example, "Why do you think Matthew Flinders joined the Royal Navy?" Closed questions usually require a factual or limited response and usually begin with "when" or "what", for example, "When did Matthew Flinders set sail in the Investigator to circumnavigate Australia?"

For further information about types of questioning refer to:

- *Classroom questioning* at **http://www.nwrel.org/scpd/sirs/3/cu5.html**
- *Questioning techniques for gifted students* at **http://www.nexus.edu.au/teachstud/gat/painter.htm**

Bloom's taxonomy (Bloom, 1956) is particularly helpful in planning activities at the following levels:

- knowledge
- comprehension
- application
- analysis
- synthesis
- evaluation.

Low-level questions require remembering, observing or translating and are classified in the first three categories of knowledge, comprehension and application. Most of us use questions that are in these categories, but for gifted students greater emphasis should be placed on the higher-order skills of analysis, synthesis and evaluation. Students of lesser ability should also be given opportunities to answer higher-order questions, but they will spend more time than gifted students in completing the lower-order tasks.

It cannot be assumed that the more able students in the class have all the prescribed knowledge. The pre-test may demonstrate that some students have limited knowledge of Matthew Flinders but that they have excellent critical thinking skills, verbal ability or creativity. This is an indication that these students will benefit from a curriculum that provides more opportunity for higher-order thinking.

The following grid provides cues to enable the formulation of questions for the achievement of appropriate student outcomes.

Table 6: Applying Bloom's taxonomy

Thinking processes	Examples of useful question cues		Sample question stems
Knowledge	List Show Quote Describe Collect Recall	Who When Where Identify Locate Define	List the characteristics of one of the main characters Recall details about the setting at … Arrange the sequence of events in chronological order Describe what happened at …
Comprehension	Outline Explain Predict Summarise Restate	Discuss Compare Interpret Contrast Distinguish	Explain how … felt while … Construct a pictorial timeline that summarises … What do you think could have happened after …? Can you distinguish between …? Contrast … with …
Application	Demonstrate Examine Illustrate Calculate	Classify Show Solve Construct	Construct a model to demonstrate … Examine the personality of … with a view to … Think of a situation that occurred and demonstrate how you …
Analysis	Analyse Distinguish Compare Contrast	Investigate Categorise Explain Separate	Which event could not have happened if …? How is … similar to …? What are some of the problems of …? What were some of the motives behind …? What do you see as other possible outcomes?
Synthesis	Create Invent Compose Predict Construct	Plan Design Imagine Improve Propose	Conduct an investigation to … What is a possible solution to …? Develop a proposal to … Compose a song about … Devise a way to …
Evaluation	Judge Select Choose Justify Debate	Recommend Assess Prioritise Determine Decide	Conduct a debate about … Was there a better solution to …? What changes to … would you have recommended? Judge the value of … How would you feel if …? How effective were …?

(Adapted from Landvogt, 1997)

More examples of questions and exercises using Bloom's taxonomy can be found at **http://www.curriculumsupport.nsw.edu.au/gats/index.cfm**

Illustrated below is a revised taxonomy, created by Anderson et al. (2001) and based on Bloom but expanded to reflect current research about learning. The revised taxonomy incorporates the types of cognitive processes that are being used to achieve outcomes and also the type of knowledge that is involved in its achievement. The grid gives a means to align outcomes with teaching strategies and assessment.

Table 7: Revised taxonomy of cognitive processes

	Cognitive processes					
Types of knowledge	Remember	Understand	Apply	Analyse	Evaluate	Create
Factual: Basic elements that students must know to be informed about a subject or discipline and work in it.						
Conceptual: Knowledge of how the basic elements or ideas in a subject or discipline are related.						
Procedural: Knowledge about how to do things.						
Metacognitive: Knowledge about cognition and a personal awareness of one's own cognition and strategies for controlling thinking processes.						

(Anderson et al., 2001)

Examples using the Anderson et al. (2001) taxonomy are available at **http://www.curriculumsupport.nsw.edu.au/gats/index.cfm** and in the section, *Samples of units of work*, at the end of this document.

Curriculum models

A program should strive for the optimal match between learner capacity and level of experiences provided. Some children have greater facility with abstract thought, critical reasoning and metacognitive skills than others (Braggett, Morris & Day, 1999). This means that to avoid underachievement, a curriculum needs to be developed that will both challenge and stimulate students appropriately.

Numerous models of curriculum differentiation can be applied creatively to produce programs that provide flexibility and choice for the range of individual differences in

the classroom. These models show how content, teaching and learning processes and products can be fine-tuned to meet the needs of gifted students.

The Maker model

Maker (1982) devised a very practical model of curriculum differentiation. This model shows how content can be adjusted to accommodate the ability of gifted students to manipulate abstract ideas and deal with complexity. The process component of the model involves the methods that are used by teachers to present information, the questions asked of students and the mental and physical activities expected of them. This dimension of curriculum design is focused on higher-level thinking, creative problem-solving, decision-making, planning and forecasting.

Maker (1982) also emphasises the importance of allowing students to create products that solve real-world problems. It is also important to provide gifted students with the opportunity to present work to a variety of audiences for constructive appraisal. Gifted students benefit from negotiating evaluation criteria and being involved in the process of evaluation itself. These ideas are consistent with the practices recommended in the document *Quality teaching in NSW public schools: Discussion paper* (NSW Department of Education and Training, 2003).

The Maker model provides a framework for developing optional material that can be incorporated into a program for gifted students. Not all of the possible adjustments need to be adapted; only those that will lead to meaningful outcomes for gifted students should be incorporated. The template below (Table 8) outlines the types of adjustments to curriculum that can be made.

Table 8: Maker model: Modifications

Content modifications

Abstraction (The focus of discussions, presentations and reading materials should be on abstract concepts, themes and theories)	Going beyond the facts
Complexity (Complexity is determined by examining the number and difficulty of concepts and disciplines that must be understood or integrated)	Dealing with greater breadth and depth
Variety (Students can work on different aspects of a broad theme and in their areas of interest)	Being exposed to new ideas or content
Organisation (Content is organised around key concepts or abstract ideas)	Selecting new arrangements of content
Study of people (Students research the lives of creative and productive individuals)	Relating content to humans
Methods of inquiry (Students study the methods of inquiry used in different disciplines)	Relating content to the methods used in a particular field

Process modifications

Higher-order thinking skills (Instructional methods should stress the use rather than the acquisition of information)	Using questions from the analysis, synthesis and evaluation area of Bloom's taxonomy
Open–ended processing (Questions are provocative in that they stimulate further thinking and research into a topic)	Encouraging divergent thinking
Discovery (Activities stimulate inductive reasoning to find patterns and underlying principles)	Adopting an inquiry approach to determine own conclusions
Proof and reasoning (Students are required to explain the reasoning that led to their conclusions. Students learn about other students' approaches and learn to evaluate reasoning processes)	Being required to give reasons, substantiate conclusions
Freedom of choice (Choice of activities can be motivating and independent learning can meet the gifted student's preference for self-regulation. Some students need support to become independent learners)	Having opportunities for self-directed learning
Group interactions of like-ability peers (Structured and unstructured activities should be provided to enable both intellectual and socio-affective goals)	Enabling group problem-solving

Product modifications

Real–world problems (Products should address problems that are meaningful to the students)	Investigating real-life problems
Real audiences (Gifted students are not developing products that are evaluated only by the teacher)	Using products for evaluation by teachers, peers, community, particular readership
Evaluations (Gifted students' products should be evaluated by appropriate audiences, their peers and themselves)	Undertaking teacher assessment and student evaluation using pre-established criteria
Transformation (Original work is produced when students are engaged in higher-order thinking)	Finding practical uses for what is learned

(Adapted from Gross, Sleap & Pretorius, 1999)

To illustrate the kinds of curriculum adjustments that can be made, consider the context where students are learning about the natural environment and are expected to achieve the following outcomes from the *Science and Technology K–6 Syllabus*. (The following could be modified for cross-curriculum studies including outcomes from the English and Human Society and Its Environment syllabuses).

Outcomes:

ES S3.6 *Recognises that the Earth is the source of most materials and resources, and describes phenomena and processes, both natural and human, that form and change the Earth over time*

INV S3.7 *Conduct … own investigations and make … based on the results of observing, questioning, planning, predicting, testing, collecting, recording and analysing data, and drawing conclusions*

Table 9 provides examples of possible activities using the Maker model.

Table 9: Maker model: The beach

Content modifications

Abstraction	Students examine material about different types of beaches. What is a beach and what kinds of beaches are there?
Complexity	Students consider the ways in which beaches are formed. What is the connection between a beach and the sea? How are beaches made?
Variety	Content additional to the regular curriculum is studied. What is sand? How can sand vary in composition from one beach to another? Why?
Organisation	Students conduct research about the geographical patterns of types of beaches. Choose a country in the Northern Hemisphere and compare and contrast its beaches with those of Australia.
Study of people	What are the human uses of beaches apart from recreation? Research the life of a famous artist, surfer, entrepreneur or engineer whose livelihood was closely connected with the beach environment.
Methods of inquiry	Are beaches privately or publicly owned? How are laws made about private and public ownership?

Process modifications

Higher-order thinking skills	Design the perfect beach.
Open-ended processing	What uses or purposes for beaches can you suggest that have not already been considered?
Discovery	What economic value do beaches currently have?
Proof and reasoning	Are sea levels changing? Provide evidence for your conclusions.
Freedom of choice	Develop a research question about your local beach and devise a procedure to answer it.
Group interactions	In small groups, discuss what the beach environment means for each person.

Product modifications

Real-world problems	Students investigate how a mining company obtains useful resources from a beach.
Real audiences	Students develop products for evaluation by various people or groups e.g. peers, teacher, parents, Shire Council and make presentations about the social and economic values of beaches.
Evaluations	Students develop criteria to judge the extent of achievement of outcomes.
Transformation	Students produce a play called "The beach".

Activity 1
Locate the document, *Activities for differentiating the curriculum* at **http://www.curriculumsupport.nsw.edu.au/gats/index.cfm**
Using your syllabus documents, select a content outcome and a skills outcome. Using the Maker template, develop activities and/or questions for each content, process and product modification.

The Williams model

The second model that provides ideas about how to infuse a program with challenge for gifted students is that designed by Frank Williams (1993). This model is based on studies of the creative person and process. It has the following three dimensions:

Dimension 1: This consists of subjects that make up the school curriculum. The K–12 content is the vehicle for students to think and feel about.

Dimension 2: This comprises 18 strategies to be used by the teacher to develop students' thinking and creativity.

Dimension 3: This consists of eight student processes that have been shown empirically to be involved in creative thinking.

These processes include the opportunity for creative thinking (characterised by fluency, flexibility, originality and elaboration). The teaching strategies also enable students to demonstrate the personality factors of curiosity, imagination, risk-taking and complexity that have been identified as important processes for the expression of creativity.

This model provides a useful framework for developing questions and activities that will provide stimulation and the opportunity for thinking. The table below provides examples of the types of questions discussed in Dimension 2 of the Williams model.

Table 10: Williams model: The Anzac legend

1. Paradox At first glance this is something that appears to be self-contradictory or absurb. Paradoxes can be used to evaluate ideas and challenge students to reason and find proof.	National identity comes from glorious defeat or does it?
2. Attribute listing This involves the skill of analysis. Students can be asked to list the attributes or the properties of something.	What is an Australian?
3. Analogy Students find the similarities between things and compare one thing to another.	How is Australia Day like Anzac Day?
4. Discrepancy Williams is referring to the exploration of deficiencies in a person's understanding. Students should be challenged to discuss what is not known or understood.	When did Federation occur? What did it hope to achieve?
5. Provocative questions These are questions that require thoughtful consideration to clarify meaning or develop new knowledge. Many types of challenging questions can be posed to elicit higher-order thinking, using Bloom's taxonomy, e.g. questions that require analysis, synthesis and evaluation.	Is Anzac Day an appropriate symbol for a multicultural country?
6. Examples of change Demonstrate the dynamic nature of things, make modifications or alterations.	How would the legend be different if the troops had landed in the right spot?
7. Examples of habit Teach about rigidity, fixations and habit.	What traditions are associated with Anzac Day?
8. Organised random search Given a situation or body of knowledge, possibly from an historical context. Ask students to search for other information to answer questions, such as "What would you do?" or "What would you have done?" Justify your response.	What was Australia like at the start of WWI? Would you have chosen to enlist and leave its shores?
9. Skills of search This involves searching for ways in which something has been done before or searching for the current status of something, for example, looking for cause and effect, analysing results, drawing conclusions.	Find the name of one author who has studied what happened at Gallipoli. Provide a summary of his or her findings.
10. Tolerance for ambiguity In other words, an observation could mean one thing or it could mean something else. Pose open-ended questions, provide situations that puzzle. This is a good technique that leads to self-directed learning.	Wartime nurses saved humanity but were helping the war effort too. Do you agree?
11. Intuitive expression Being sensitive to inward hunches or nudges.	Pretend that you are on the beach at Gallipoli. What is racing through your mind?

12. Adjustment to development Learn from mistakes and failures. Show how failure, mistakes and accidents have led to worthwhile discoveries.	How did warfare change in the twentieth century?
13. Study creative process Analyse the traits and characteristics of eminently creative people through biographies.	In what ways do you consider that soldiers fighting in the trenches would need to be resourceful in order to survive? Find a story about one of the survivors and discuss what you think helped him or her to survive.
14. Evaluate situations Evaluate solutions and answers in terms of their consequences and implications. Pose the question: "What if?"	How could Gallipoli have been avoided?
15. Creative reading skills Students generate as many ideas as possible after reading a text. This can stimulate a student to develop new ideas.	Select a book to read about the Gallipoli story and write a book review or blurb for a dust cover.
16. Creative listening skills This is the skill of generating ideas by listening.	Students listen to a book excerpt e.g. *Simpson and the donkey: The making of a legend* by Peter Cochrane (1992). They then write a poem capturing the essence of the story.
17. Creative writing skills This is the skill of generating and communicating ideas through writing.	Write a letter home from the point of view of a soldier, nurse, photographer.
18. Visualisation skills Provide opportunities for students to perceive or visualise themselves in many contexts.	Imagine you are in a trench at Gallipoli. Sketch what it looks like.

(Adapted from Gross, MacLeod, Drummond & Merrick, 2001)

The Maker and Williams models give us a framework for creating programs designed to stimulate students' critical and creative thinking. The challenge is to use the models in a considered way to create exciting opportunities for gifted students.

Activity 2
Locate the document, *Activities for differentiating the curriculum*, at
http://www.curriculumsupport.nsw.edu.au/gats/index.cfm
Using your syllabus documents, select a content outcome and a skills outcome, and develop activities and questions using the appropriate strategies outlined in the Williams model.

Relationship of the NSW model of pedagogy to practice in gifted education

It is useful to reflect on the way in which approaches in gifted education relate to the pedagogy discussed in *Quality teaching in NSW public schools*. The connection between gifted education and the NSW model of pedagogy will be explored in greater depth in future publications.

Writing units of work for gifted students

Gifted students can be catered for with extension and enrichment opportunities and through acceleration.

What are extension and enrichment?

Extension is the provision of opportunities at a greater level of challenge to the student. A combination of practices, including acceleration, grouping and differentiation of the curriculum, allows gifted students access to meaningful learning opportunities. Substantial gains in learning can be made when gifted students are grouped and accelerated, but only if they have access to a developmentally appropriate curriculum (Rogers, 2002).

Enrichment is the provision of breadth in the curriculum at the same level of challenge to the student. All students should have access to enrichment at the appropriate intellectual level; opportunities should not be provided exclusively for gifted students when all can benefit from the experience (Passow, 1982). However, enrichment that is appropriate for gifted students is not suitable for all students. The activities involved would not match the learning needs of every student.

Three useful tests for deciding whether curriculum opportunities are appropriate for gifted students are:

- Would all students want to be involved in such learning experiences?
- Could all students participate in such learning experiences?
- Should all students be expected to succeed in such learning experiences?

(Passow, 1982)

If the answer to each of these questions is a firm and considered no, the curriculum is differentiated to cater for the individual needs of gifted students.

If the answer to each of these questions is yes, the curriculum is not differentiated to cater for the individual needs of gifted students.

The following example illustrates the distinction between enrichment and extension activities. Consider the *Science 7–10 Syllabus* and Outcome 4.8: *a student describes features of living things*. This essential content requires students to learn about cell theory and to:

- identify that living things are made of cells
- identify and describe the functions of the nucleus, cytoplasm, cell membrane, cell wall, chloroplast
- identify that substances move in and out of cells
- distinguish between unicellular and multicellular organisms.

A further, optional activity that requires students to identify substances needed by living cells, and explain why each is needed, is an example of enrichment. Students who undertake this option develop their knowledge and research skills at the same level of difficulty as the essential content. An extension opportunity enables students to study related concepts and manipulate them to develop a deeper understanding of cell theory. An illustration of this would be for students to investigate the nature of cell membranes and hypothesise about their structural characteristics.

When teachers create programs for gifted students, it is important that they discover students' current levels of knowledge, skills and understanding. This includes their attainment of learning outcomes. Some students may not have achieved many outcomes at their stage level, but may nevertheless benefit from exposure to a more demanding curriculum. Outcomes need to be differentiated to match a more abstract program, a faster pace of learning and students' abilities to make connections across disciplines.

Students who have achieved substantially at their stage level should have the opportunity to attempt outcomes at higher stages. This needs to be written into programs.

Assessment

Teachers may find it difficult to motivate gifted students to complete more demanding and complex tasks if these students believe that they will be discriminated against through being assessed on their differentiated work. However, it is important that students working at a more complex level are assessed at that level, so that they develop a realistic appreciation of their ability and performance. The potential sense of injustice can be avoided if gifted students clearly understand the outcomes expected from them and the benefit which these outcomes have for their progress in learning and skill development.

The Kaplan model

The Kaplan model, like that of Maker, examines the differentiation of the curriculum in content, process, product and learning environment. The Kaplan model provides a useful template and reflection tool for planning a differentiated curriculum. The principles that guide curriculum decisions for the gifted within this model are:

- a focus on major issues and concepts
- a use of activities that show the interrelationships between subjects
- an emphasis on research
- the teaching of thinking skills
- higher-order thinking
- increased complexity and pace
- a focus on student self-direction.

(Kaplan, 1993)

The learning experience in the Kaplan model centres on a theme, which is valuable for gifted students because they tend to learn holistically and make connections with other knowledge skilfully. The more highly gifted do so with even greater ease (Gross, 2000). The following steps should be followed in developing units of work under the Kaplan model:

1. Use the Board of Studies syllabus documents to select the content and skill outcomes for a subject area.
2. Choose an organising concept or theme to suit the selected outcomes.
3. Create appropriate higher-order questions, activities, tasks and products that effectively assess the designated outcomes chosen.
4. Determine assessment criteria.
5. Develop pre-testing procedures.

6. Describe the sequence of teaching and learning experiences, incorporating skills and performance expectations of students to address achievement of outcomes.
7. Evaluate the unit of work.

Learning environment

The selection of the content, process and product will affect the type of learning environment that develops under the teacher's influence. Several factors, together with the nature of the outcomes, will influence the selection of teaching strategies:

- the characteristics of the group of gifted students
- the students' interests
- the developmental level of the students
- the type of gifted program.

Board of Studies syllabuses and the creation of programs

The Board syllabuses define the knowledge, understanding, skills, values and attitudes that students should develop through engaging in a course. They also describe extension activities and study options. It is useful to consider the ideas that the syllabus has to offer for meeting the needs of gifted students. The following example shows how the Kaplan grid was used within the syllabus to develop additional questions catering for advanced learners in a Stage 4 history class.

Rationale:

> "The study of history provides the intellectual skills to enable students to critically analyse and interpret sources of evidence in order to construct reasoned explanations, hypotheses about the past and a rational and informed argument."
>
> (*History Years 7–10 Syllabus*, Board of Studies, 2003, p. 8)

The history syllabus provides opportunities to address the needs of gifted students through the examination of perspectives of history, engagement in civics and citizenship education, the development of research skills and the acquisition of literacy skills.

Outcomes

A student:

4.2 *describes significant features of Aboriginal and indigenous cultures, prior to colonisation*

4.10 *selects and uses appropriate oral, written and other forms, including ICT, to communicate effectively about the past*

Table 11: Kaplan model: Aboriginal history and culture

Theme	Basic skill	Research skill	Productive skill	Product	Outcome
Change	Classifying Describing Communicating Recording Analysing	Application of the information process (NSW Department of Education, 1989)	Distinguish warranted and unwarranted conclusions Distinguish reliable and unreliable sources of information Modification – change or reformulate ideas/ problems/solutions	(mandatory plus optional) Oral presentation Poetry Painting Research report News article Play	4.2 4.10

Articulating activity

(Logical sequence of teaching this learning experience, incorporating all skills and product expectations to reflect on the theme.)

Context: This teaching and learning sequence is based on the time period prior to 1788.
Students:

1. discuss the special relationship that Aboriginal people have with the land
2. describe the components of Aboriginal peoples' education or learning
3. explain how Aboriginal culture was transmitted
4. specify the stages in attainment of adulthood
5. describe the lifestyle of Aboriginal peoples, including shelter, technology, hunting/gathering/fishing.

Differentiated activities:

(a) How do we know the nature of indigenous cultures if they did not leave written records before colonisation?
(b) Outline the methods of inquiry that have been used to understand Aboriginal history. Some Aboriginal historians think that Aboriginal history should be recorded not only through oral traditions but also through the written word. Express your views in an exposition about the merits of this proposal.
(c) People may have conflicting views of the history of Aboriginal people before white settlement. Discuss two different perspectives of an aspect of Aboriginal history. Why do you think different views of history can arise?
(d) Consider the following statement:
All Australians have an opportunity to better understand their past and present. This understanding is a necessary part of the process of reconciliation.
Explain why you agree or disagree with this statement.

This example illustrates how options can be provided in a program to cater for the range of individuals in a class. It also illustrates how ideas from the Maker and Williams models can be incorporated to stimulate critical and creative thinking skills.

Samples of units of work

The following samples of units of work illustrate how both extension and enrichment can be incorporated into programs to cater for gifted and talented students. Each sample outlines the context for the learning activity, the content and skill outcomes and the responses expected from students. These show teachers how to provide for individual differences in a standards-referenced approach. The following are excerpts from units of work and although brief are intended only to provide an illustration of the principles that guide provision for gifted and talented students.

No. 1. Sample unit for Stage 3: K–6 Science and Technology

Context

Students are interested in how safety devices work. There has been a house fire in the area, which was thought to be due to a faulty electrical system. The students have posed the question, "How can an electrical system be made safe?"

This set of learning activities requires different levels of scaffolding and teacher direction to enable students of varying abilities to achieve the desired outcomes. Gifted students are generally self-directed and benefit from the opportunity to engage in more complex and abstract thinking. Opportunities for students to learn about scientific methods allow them to demonstrate an advanced capacity to communicate in scientific language.

For example, an important goal for education in Science and Technology is an understanding of the design of a fair test of a hypothesis. To develop a fair test, students need to appreciate the meaning of the term *variable*. The following questions should be given to students to help them plan their test:

- What are the variables?
- Which variables will be manipulated?
- Which variables will be kept the same?
- Which will be measured?

Outcomes

Content strand PP S3.4:

- *Identifies and applies processes involved in manipulating, using and changing the form of energy*
    - Determines, records and reports on the conditions necessary for an electrical circuit to operate, e.g. light a bulb
    - Devises a fair test to find out which materials conduct electricity most effectively and shares findings

Learning processes INV S3.7:

- *Conducts own investigations and makes judgements based on the results of observing, questioning, planning, predicting, testing, collecting, recording and analysing data and drawing conclusions*

Learning processes UT S3.9:

- *Evaluates, selects and uses a range of equipment, computer-based technology, materials and other resources to meet the requirements and constraints of investigating and designing tasks*

Table 12: Sample lesson plan in K–6 Science and Technology

Background
Students have through teacher demonstration, learned the names of circuit components and observed how to create a circuit with battery, leads, switch and ammeter. Students deduce that electricity can flow through circuitry components when connected in particular ways. Students are then directed to group activities to perform the following segment.

Objective	Activity	Outcome
Students determine the components of an electrical circuit: a source of potential difference (battery, electricity supply), connecting wires and a load device that consumes energy (light bulb).	Students are supplied with electrical equipment and construct a circuit operating a light bulb. (This activity is by trial and error. Some students will require more teacher direction than others to perform the task). Students propose ideas for why the globe lights up.	Determine, record and report on the conditions necessary for an electrical circuit to operate e.g. light bulb. Students deduce that an electrical current is flowing through the circuit and that the light globe is a conductor. Conduct own investigations and make judgements based on the results of observing, questioning, planning, predicting, testing, collecting, recording, and analysing data, and drawing conclusions.
Students collect and test various materials for electrical conductivity.	Students design a scientific experiment to test materials for conductivity. Students work in groups to complete activity. Teacher provides varying degrees of assistance to provide for individual differences in ability to complete the task.	Devise a fair test to find out which materials conduct electricity most effectively and share findings. Conduct own investigations and make judgements based on the results of observing, questioning, planning, predicting, testing, collecting, recording, and analysing data, and drawing conclusions. Evaluate, select and use a range of equipment, computer-based technology, materials and other resources to meet the requirements and constraints of investigating and designing tasks.
Students determine uses for insulators and conductors e.g. insulation, fuses, safety switches.	Students use the information process (NSW Department of Education, 1989) to select, organise and evaluate information sources (use of the Internet).	Evaluate, select and use a range of equipment, computer-based technology, materials and other resources to meet the requirements and constraints of investigating and designing tasks.

Students design an experiment to test the effectiveness of a safety switch.	Students prepare experimental outline of a suitable test for a safety switch. Students use the Internet to choose a safety switch for their evaluation. Students determine when the safety switch would cut out electricity and when it would not.	Evaluate, select and use a range of equipment, computer-based technology, materials and other resources to meet the requirements and constraints of investigating and designing tasks.

Differentiating the curriculum and its applicability to the *K–6 Science and Technology Syllabus* and *Independent research and the K–6 Science and Technology Syllabus* are available at
http://curriculumsupport.nsw.edu.au/gats/index.cfm

No. 2. Sample teaching units for Years 5–6 in K–6 Science and Technology: Living science and Antarctica: Your story

Context

Designing, making and investigating, and the use of technology, give students freedom to explore, experiment, follow interests and be involved in tasks that are not continually structured by a teacher. The following science units were developed for students in the Years 5 and 6 opportunity classes at Illaroo Road Public School. They reflect the intent of the *Science and Technology K–6 Syllabus* to cater for gifted and talented students.

Outcomes

INV S3.7:

- *Conduct their own investigations, make judgements based on the results of observing, questioning, planning, predicting, testing, collecting, recording and analysing data, and draw conclusions*

DM S3.8:

- *Develop and resolve a design task by planning, implementing, managing and evaluating design processes*

VA1:

- *Demonstrate confidence in their own ability and a willingness to make and implement decisions when investigating, designing, making and using technology*

6W Term 3 contract: Living science

You MUST choose EIGHT questions from this list, including at least two from the Evaluation and Synthesis columns.
The questions are based on Bloom's revised taxonomy.

Knowledge	Comprehension	Application	Analysis	Evaluation	Synthesis
1. Prepare for a career in science. Write a brief description of your chosen field in science and why you would choose it.	2. Write extensions of these starter statements that are related to the scientific method: Observation is necessary because … A hypothesis is important because … Experimentation is necessary because …	3. Water can do interesting things, optically speaking. Find an experiment using water to aid vision or to change the way we see things. Write it up using the scientific method.	4. Choose an experiment that interests you. It can be in any area of science. Over the time of the contract carry out your experiment, including keeping a diary or journal of how it is progressing over the eight weeks.	5. Write an argument text on the topic: "That the scientific method is necessary for good science."	6. Inventions – Australia's best! Go to **http://www.web-and-flow.com/members/hbutler/austinvent/webquest.htm** Follow the instructions, working on your own instead of as part of a team.
7. Make a chart or poster describing the scientific method, setting out all the steps involved in working in the scientific method.	8. Make a list of as many varied branches of science as you can and make a poster showing all the different types of science involved.	9. Explain how the various branches of your science relate to the whole of human knowledge about the topic. (Use information from question 8.)	10. Finish the following statement (produce at least a page of information). "The greatest scientist of the twentieth century was …"	11. Produce a detailed, labelled diagram of one of the scientific instruments that interests you most. Explain why it interests you.	12. GE Foods: Friend or foe Go to: **http://home.earthlink.net/~spcemonk/webquest.html** Carry out the webquest on your own.
13. Find the names of at least five women scientists and produce a report on their work and its importance to our modern world.	14. List the six simple machines and the special attributes of each one. Include a diagram and an explanation of the basic purpose or function of each.	15. Grow something! Over the contract, grow something in a pot. Find out as much as you can about your plant and document its growth.	16. Finish the following statement by writing a series of interviews with inventors and scientists. "The most important invention ever for human kind is…"	17. Can we live anywhere on earth? Go to: **http://www.classroomantarctica.aad.gov.au/unit3_menu.html** This webquest deals with living in an extreme environment.	18. Mars or the moon? Go to: **http://www.personal.psu.edu/faculty/j/x/jxz8/Student_Webquests/brown/quest.htm** This webquest will interest those of you with a passion for astronomy!

You may choose to hand in one question each week (that is, Weeks 2, 3, 4, 5, 6, 7, 8 and 9) or to hand in all the questions together in Week 9. You must let me know by the end of Week 1 next term which way you would prefer to work. Please remember to put your name on your work! This term should see you really exploring ideas about science and its place in our world. Have fun!

5W Term 4 contract: Antarctica: Your story

Your task this term is to write and publish a book, using Antarctica as your theme. You may choose from a wide variety of genres – narrative, picture book, children's book, non-fiction text, biography, autobiography.

You will have two sessions each week, Mondays and Thursdays, in which to work on your contract. You'll be able to save it on the school network (I strongly suggest you also keep it on a disk) which you can also access from the classroom. Because we'll be working in the Library, you'll also be able to access the scanner to help illustrate your work.

Time management
You have 8 weeks to research, write, illustrate and publish your story. I suggest you set aside the last one to two weeks for final detail, illustration and printing of your work. Remember, the finished product is very important! Allow the first two weeks for research and preliminary writing; that gives you four solid weeks for writing. I will expect to see a final draft by Friday 23 November!!

The objectives addressed in these contract units enable students to develop a logical approach to problem solving and scientific inquiry. Students develop skills in the use of appropriate language, design processes, including aspects of time management, design constraints and needs of the target audience. These activities are well suited to gifted students' preference for self-regulated and independent work.

Created by Illaroo Road Public School

No. 3. Sample unit: Key words in the Higher School Certificate

Context

The NSW model of pedagogy emphasises higher-order thinking and metalanguage as key elements in best teaching practice.

> Simple explanations of language, such as giving definitions and using them in context, are a basic form of metalanguage. More advanced uses of metalanguage would include consideration of how the language (or symbol system) being analysed works to structure meaning in particular ways.
>
> (NSW Department of Education and Training, 2003, p. 21)

Although gifted and talented students are usually adept at complex thinking and language use, they often benefit from the explicit teaching of higher-order thinking skills (see section 1.4 in *Quality teaching in NSW public schools: A classroom practice guide*, 2003). This activity was developed by Baulkham Hills High School because a significant number of senior students did not demonstrate an understanding of the key verbs in the HSC syllabuses. This activity is applicable across key learning areas for all students but the opportunity to think at a metacognitive level is particularly suited to gifted and talented students.

Outcome

H13

- *A student uses terminology and reporting styles appropriately and successfully to communicate information and understanding*

Table 13. Sample of lesson plan for BOS HSC glossary

Objective	Activity	Outcome
Students understand the key words provided in the BOS HSC glossary.	Students are provided with *The new Higher School Certificate: Some key words*. Students highlight words commonly found in Physics questions and analyse and compare word definitions and usage.	Students understand the meanings and inferences of the terminology.
Students relate key words to levels of thinking in Bloom's taxonomy (1956).	Students discuss Bloom's taxonomy and the different cognitive processes required in a task.	Students are able to discriminate the levels of cognitive processing required by a question.
Students recognise the level of cognitive processes required in an examination question.	Students complete a series of exercises of increasing complexity to apply their understanding.	Students understand and can confidently and in an appropriate way respond to questions.

Created by Baulkham Hills High School

This activity is available on the Gifted and Talented web site at **http://www.curriculumsupport.nsw.edu.au/gats/index.cfm**

No. 4. Sample unit in Stage 4 History: Heritage

Context

Students study the nature of history by using primary and secondary sources to answer questions about the past. In this learning activity students develop an understanding and appreciation of heritage from family and community through to global perspectives of heritage that is naturally and culturally significant.

Outcomes

4.1

- *Students describe and explain the nature of history, the main features of past societies and periods and their legacy*

4.7

- *Students identify different contexts, perspectives and interpretations of the past*

4.10

- *Students select and use appropriate oral, written and other forms, including ICT, to communicate effectively about the past*

The following grid can be used to illustrate how:

- each outcome can be mapped onto the taxonomy table in terms of the types of cognitive skills and knowledge it requires (for fuller description of this, see Anderson et al., 2001)
- the mapping process influences the selection of appropriate teaching strategies
- assessment procedures are then aligned to content, process and teaching strategies.

Table 14. Sample of lesson plan for Stage 4 History

Objective	Activity	Outcome
Students will develop a knowledge and understanding of the nature of history, past societies and periods and their legacy.	1. Compare and contrast in what ways music, art or costume reflect the culture of a past and present society.	Students present, explain and use a range of specific and relevant historical information to communicate the results of their research (X).
	2. Assess one or more influences which British settlement still has on our culture today e.g. monarchy, legal system, architecture, language, religion.	Students evaluate with accuracy and detail the relationship of British settlement and culture to contemporary Australian society (Y).

In the following table, Activity 1 aligns at point X with analysis of concepts by comparing and contrasting contemporary and past cultures. Activity 2 aligns at point Y with evaluation of concepts by assessing the impact of British settlement on Australian society.

Table 15. Taxonomy of learning

	Cognitive processes					
Types of knowledge	Remember	Understand	Apply	Analyse	Evaluate	Create
Factual						
Conceptual				X	Y	
Procedural						
Metacognitive						

This assists in determining the teaching strategies and assessment procedure. For example, open-ended activities using the information process (NSW Department of Education, 1989) would be appropriate for these tasks. Suitably complex assessment tasks require students to identify elements of related concepts and communicate the relative similarities and differences. Additionally, students would be required to justify their position about the merits of specific aspects of British settlement.

No. 5. Sample unit in Stage 5 History: Post-war Australia

Context

This unit *Postwar Australia to the 1970s: The changing role of women*, was created for a Year 10 History class for gifted students at Chatswood High School, and was also trialled with one of the mainstream classes.

- Chatswood High School is on the lower north shore of Sydney.
- The school has about 700 students.
- There is a large NESB population (60%).
- It is a partially selective high school. The first selective intake was in 2002 but a gifted and talented class was introduced in 2001.
- The challenge is to develop effective curriculum delivery for an extremely diverse student population.
- Staff at Chatswood High School have undergone training for the Gifted Education Research, Resource and Information Centre (GERRIC) certificate course offered by the University of NSW.

Outcomes

5.1

- *Explains social, political and cultural developments and events and evaluates their impact on Australian life*

5.3

- *Explains the changing rights and freedoms of Aboriginal peoples and other groups in Australia*

5.9

- *Uses historical terms and concepts in appropriate contexts*

5.10

- *Selects and uses appropriate oral, written and other forms, including ICT, to communicate effectively about the past for different audiences*

Unit of work

The Kaplan model was one of the models of curriculum delivery presented during GERRIC training. The History faculty believes that this model particularly suits the curriculum of this subject as:

- the elements of the learning experience surround a central theme to provide extensive and interconnected learning
- the model examines the differentiation of curriculum in the areas of content, process, product and environments.

Table 16: Sample lesson plan for Year 10 History: The changing role of women

Theme	Basic skills	Research skills	Productive skills	Products
Issues relating to the changing role of women in Australia	• Describing • Sequencing • Recording • Analysing • Investigating • Inferring • Graphing • Charting • Communicating • Judging	• Note taking • Interviewing • Using the Internet • Using journals, magazines and newspapers • Substantiating • Conducting bibliographic research • Establishing the criteria to judge	• Concluding • Selecting information • Imagining • Fact finding • Engaging in inductive thinking	• Oral task • Written report • Research report • Chart • Timeline • Poster • Annotated bibliography

Articulating activities

Logical sequence of learning experiences, incorporating all skills and product expectations to reflect on the theme.

Activities:

1. Conduct a library search on the topic of women in Australian history and construct an annotated bibliography of both texts and Internet sites.
2. Construct a bar graph showing the percentage of women participating in the workforce in the period 1945 to 1979. Group your data by the following years: 1945–49; 1950–54; 1955–59; 1960–64; 1965–69; 1970–74; 1975–79. Describe the trend of participation shown by these year groups.
3. Design a commemorative poster celebrating women's achievement of equal pay in 1972. Link the message on this poster with any of today's issues about equal pay for women.
4. (a) Create a timeline showing the following events in the changing role of women:
   Roma Mitchell QC appointed to the South Australian Supreme Court as Australia's first woman judge; The National Wage & Equal pay Case Judgement;
   Oral contraception for women goes on sale;
   Women granted the right to sit on juries;
   The Maternity Leave Act;
   The New South Wales Equal Pay Act;
   Publication of Germaine Greer's *The female eunuch*;
   Women's Electoral Lobby (WEL) established.
   (b) Select one of these key events and explain its importance to the changing role of women.
5. Research the lives of ONE of the following women and design BOTH an oral presentation and a 300 word biographical report on her life and achievements: Ada Bromham; Bessie Rischbieth; Zelda D'Aprano; Faith Bandler; Pearl Gibbs; Jessie Street.
6. (a) Interview three women from differing age groups. In this interview ask them about: their level of education; their expectations in leaving school; their actual experiences on leaving school.
   (b) Present these findings as a 300-word report on the changing role of women in Australia.
7. Assess the view that the gains for Australian women between 1945 and 1975 have significantly changed the role of women today. In your answer refer to primary and secondary sources. Attach a bibliography (600 words).

Implementation plan:

This unit is designed to be completed in 6 weeks. History has 3 x 75 - minute periods per fortnight. In-class time is to be provided, including research periods in the school library, but out-of-school commitment is expected from students as well.

Assessment of student performance will consist of a description of their performance in each of the three skills categories, as demonstrated by the students' products.

Created by Chatswood High School

No. 6. Sample unit in Mathematics: Patterns and algebra

Context

The aim of Mathematics K–10 is:

> to develop students' mathematical thinking, understanding, competence, and confidence in the application of mathematics, their creativity, enjoyment and appreciation of the subject, and their engagement in lifelong learning.
>
> (Board of Studies, 2002)

The rationale in the syllabus for Years K–10 describes mathematics as a reasoning activity that uses abstraction and generalisation to identify, describe and apply patterns and relationships. It incorporates the processes of questioning, reflecting, reasoning and proof. The process strand called *Working Mathematically* encompasses five overlapping processes:

- questioning
- applying strategies
- communicating
- reasoning
- reflecting.

These processes are integrated into the "learn to" section for each outcome within the content strands. The Working Mathematically strand provides excellent opportunities for enriching and differentiating the mathematical experiences of students. Components of a differentiated Mathematics curriculum include:

- the development of spatial skills through geometry and other media, for example, exploring fractals, platonic solids, geodesic domes
- a focus on problem-solving skills that extend an original problem and explore different solutions
- an emphasis on the use of technology
- logic problems that require deductive thinking skills and inference
- algebraic manipulations arising from an exploration of patterns
- statistics and probability.

Outcomes

NS3.1

- *Orders, reads and writes numbers of any size*

WMS3.1

- *Asks questions that could be explored using mathematics in relation to Stage 3 content*

WMS3.2

- *Selects and applies appropriate problem-solving strategies, including technological applications, in undertaking investigations*

Table 17. Example of lesson plan in Stage 3 Mathematics

The content of this unit is covered under **Additional content** (p. 10) in the syllabus.

Objective	Activity	Outcomes
Students apply an understanding of place value and the role of zero to read, write and order numbers of any size.	Students recognise the place value of numbers in numerical data that can be found in the media, for example, house prices, salaries paid to executives.	Students can interpret, compare and contrast information from the Internet, media, environment and other sources.
	Students investigate: • numbers in different bases e.g. clock to base 2 • large numbers e.g. googol and googleplex • the number of squares on a chess board (King Kaid of India) • the number of eyedrops of water that will fit on a ten cent coin.	Students can apply strategies to estimate large quantities.
	The following activities could be allocated using work cards. A list of resources to support these activities is included at the end of this sample unit. To expand the content of NS3.1, in small groups, students could investigate some of the following concepts: 1. to extend thinking on infinity (a) draw pictures of infinity e.g. a person reading a book which has a picture on the cover of a person reading a book which has ....., or use two mirrors (the teacher could provide samples of similar artwork) (b) make and study Moebius strips, Klein bottles and Klein cubes (c) class writes an infinite poem e.g. circular (d) using isometric dot paper and centimetre cubes (after work on visualising and 3D shapes), the challenge is to build something that is impossible to draw or draw something that is impossible to build e.g. an impossible cube. Drawings can change perspective and work towards infinity (e) look at the work of M.C. Escher and the way it relates to infinity. 2. to explore numbers (a) perfect numbers, happy numbers, prime numbers, amicable numbers, palindromic numbers, Fibonnaci numbers, numbers in Pascal's triangle (b) by adding numbers 1–100 (hint, begin with adding the numbers 1–10; what patterns can you find?) (c) research the work of Carl Gauss Fold different sized pieces of paper in halves. What patterns can you find in the number of times a piece of paper may be folded in half? What relationship does this have with infinity?	

The exploration of infinity provides an extension activity for gifted students because it caters to their ability to deal with difficult abstract concepts. These activities illustrate how mathematical concepts can be explored using interdisciplinary approaches. The following table provides some useful question cues to stimulate imaginative and creative solutions to mathematical problems.

Table 18. Question hierarchy to guide investigations

Levels of thinking	Guide thinking
Knowledge: recalls or memorises information	What have we been working on that might help with this investigation?
Translations: changes information into another form	How could you write/draw what you are doing? Is there a way to record what you've found that might help us see more patterns?
Interpretation: discovers relationships	What's the same? What's different? Can you group these in some way? Can you see a pattern?
Application: uses appropriate generalisations and skill to solve problems	How can this pattern help you find an answer? What do you think comes next? Why? What can you say about this type of problem? What mathematics could be used?
Analysis: solves a problem—conscious knowledge of the thinking, examines interrelationships of parts	What have you discovered? How did you find that out? Why do you think that? What made you decide to do it in that way?
Synthesis: solves a problem that requires original, creative thinking, goes beyond the original problem, considers alternatives	Who has a different solution? Are everybody's results the same? Why/Why not? What would happen if …?
Evaluation: makes a judgement, considers standards and quality of solutions	Have we found all the possibilities? How do we know? Have you thought of another way this could be done? Do you think we have found the best solution?

(Way, 2002)

This unit was originally created by Beecroft Public School.

Resources

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Gifted Education Services. *Fermi off the wall math league*.
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Mathematical Association of New South Wales Inc.
http://hsc.csu.edu.au/pta/mansw/

Tanunda Lutheran School. *King Kaid of India*.
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University of Exeter, Centre for innovation in mathematics teaching. *Klein cube*.
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University of North Carolina. *The oldest Escher collection on the web*.
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No. 7. Sample unit: A cross-curricular enrichment strategy

Context

The Interdisciplinary Project (IDP) is a structured cross-curricular enrichment strategy for high-ability students in Year 8. By compacting the Stage 4 curriculum in all subject areas we "buy time" from traditional subject areas, allowing students to engage in learning strategies across the curriculum. Students are given the opportunity to complete a rich task of high intellectual quality and present their findings to a variety of audiences. The project encourages genuine "stretch" in learning through the application of creative problem solving strategies and engagement with the real world. This paper outlines the aims, rationale and organisation of a project which last year was presented as an *International Games Expo*.

Rationale, aims and development

Sydney Technical High School is a selective school which offers the IDP as a cross-curricular enrichment strategy to students in Year 8 in the Student Extension Program (SEP). SEP is an ability grouping program for Years 7 and 8 students. In Year 7, SEP students are grouped according to their ability using their scores in the General Ability and English components of the Selective Schools Test. In Year 8, SEP students are grouped according to a range of criteria, including their classroom performance in Year 7.

The idea of offering students a project across traditional subject areas evolved from the evaluation of the SEP program in 1999, which indicated that students would benefit from a more structured approach to extension and enrichment in all subject areas. In order to do this effectively there needed to be some compacting of the traditional curriculum to "buy time" for truly challenging learning. The idea of a cross-curricular program developed from the observation that students tended to compartmentalise their learning into traditional subject areas and often lose the "big picture" approach to problem-solving which is encouraged in primary school. It was hoped that structured enrichment in the form of a cross-curriculum project would address these issues.

Thus, the project's aims were: to extend and provide challenge in learning, to enhance transfer of learning between disciplines, and to encourage students to pose and solve complex, real-life problems, both autonomously and collaboratively.

The project has now been running for four years, and each year has responded to student and staff feedback; it continues to be modified and to evolve. Last year, in particular, we attempted to embrace the ideas of productive pedagogy and to develop a rich task of high intellectual quality which involved students in considerable engagement with the real world. The actual task was developed collaboratively with significant staff and student involvement in the development of both topic and task.

The topic of games was suggested. A generic rich task was created and supported by the development of specific rich tasks. Students were then given the opportunity to adapt and modify the task in negotiation with their teacher mentor. Thus, the process involved the collaboration of a considerable proportion of the school community (approximately a third of the staff) in the process from the beginning to the end of the project.

The task

The topic in 2003 was an *International Games Expo*, in which small teams of students were expected to complete the following task:

> Identify, analyse and resolve problems and issues in completing a specific IDP task in relation to a game or games. The project may take many forms, for example: inventing, redesigning, performing and/or marketing. It should cross several disciplines, but students may wish to explore some subject areas in more depth than others. Students are expected to make connections with the real world and to consider the social, cultural and ethical issues involved in games. The final presentation will utilise three main modes: oral/aural, visual/graphic and technological, and will be made at an international games expo in front of appropriate audiences.

Using the generic task, each team was asked to develop their own specific tasks using project language descriptors ("identify", "analyse" and "evaluate", "theorise", "engage", "resolve", "present"). Four specific tasks were also provided as models: these included, *The hundred metres sprint*, *Sporting celebrities*, *Soccer Australia*, *Drugs in sport* and *Games and popular culture*. Again, these could be modified or adapted by students. The end product was to be an International Games Expo, in which students would exhibit and present their findings to a variety of audiences consisting of parents, guests, students and teachers.

Students were expected to keep a process diary throughout the project and this was monitored. The diary was an individual reflection which documented the evolution of the project and the student's ability to solve problems in a rigorous way. Diaries were intended to be a record of the process and an insight into the students' thoughts, discoveries and learning. Students were formally evaluated at the conclusion of the project and were an important part of the process component of the project evaluation.

Project management

The thirty students in the SEP class organised themselves into eight small teams of 3–5 students each. They were given ten weeks (approximately 30 x 80-minute periods or 40 hours) to complete their task for presentation at the expo.

This was made possible by compacting the Stage 4 curriculum in all subjects for the Year 8 SEP class. The periods "bought" came from all subject areas and required students to complete course outcomes in all subjects earlier than would otherwise be the case.

Teachers were asked to nominate a number of periods in each subject on a pro rata basis which became dedicated IDP periods and timetabled as such over a ten-week period. For example, English "gave" seven periods out of a possible thirty, Science "gave" five, Art "gave" three etc. Dedicated IDP periods were booked in the library unless otherwise requested. Teams were required to bring everything they needed to these periods e.g. project proposal, process diaries, project folder and any other resources.

Each IDP team chose a mentor from their class teachers to give specific help with their project. The role of teacher mentor was to help and supervise the team from the

initial period of task negotiation, the achievement of project and subject outcomes, through to the completion of the task. Mentors worked closely with their teams, both in and out of dedicated IDP periods, and proved to be a significant factor in the success of the project.

The presentation

Each team made its presentation at an *International Games Expo* which was held in the school library over three days to a variety of audiences consisting of students from a neighbouring primary school, students from our school, and culminating in an evening presentation to family and friends.

The library was divided into eight spaces or expo booths, one for each team. These booths consisted of attractive visual displays (such as an ethical code of conduct for sports personalities), museum artefacts (such as early Olympic running shoes and starting blocks), interactive computer games designed by students and *PowerPoint* presentations. Students were expected to speak to visitors not only about the social, cultural and ethical issues raised in their project but also on task design and management issues.

The final presentation evening began with a debate on the proposition: "That the game is more important than the result". After the debate visitors were encouraged to move freely from one team's booth to another over a period of approximately an hour and a half. The staff was invited to formally assess teams' presentations during this period.

Assessment

The project was assessed by both formative and summative means. Formative evaluation consisted of regular interviews by mentors and periodic monitoring of individual process diaries. Project proposals for tasks were negotiated and approved before teams proceeded. Summative evaluation included assessment of processes and products by individuals, peers and teachers on a set of agreed criteria. The outcomes were included in the assessment for the end-of-year report. Awards of excellence were issued for outstanding projects and commendation given to others.

Evaluation

Both students and teachers were very positive about the project and believed it to be highly effective. Student comments included:

> I thoroughly enjoyed the IDP and believe I came away from it with some useful knowledge in group management and in research skills.
>
> The expo was a great success … I'd love to do it again.
>
> The best part of the IDP was the presentation part … however, it wasn't all fun and games. There was a whole lot of theoretical work and a lot of researching to find the information on our topic … This project was certainly the best group project I've been involved in.

More specifically, students reported that they had improved learning outcomes in the following areas: research skills, problem-solving, working across subject areas, communication skills, group work, creativity, lateral thinking and thinking skills.

(Created by Sydney Technical High School, Bexley)

The complete version of this enrichment task is available at
http://www.curriculumsupport.nsw.edu.au/gats/index.cfm

No. 8. Sample for Stage 4 English: Media unit

The unit *Exposing the news* was developed by Richmond River High School. This sample demonstrates some ways in which an existing unit may be differentiated to provide for the needs of students gifted in English. Its focus is to encourage students to progress beyond the essential content outlined in the syllabus for Stage 4. Activities are constructed so that gifted students are not excluded from the mainstream classroom topics and discussion. Alternative tasks also need to provide the students with a degree of choice or influence in the direction of their learning. In some instances gifted students may undertake a common task but be working to relevant Stage 5 outcomes rather than the Stage 4 outcomes identified in the original unit.

All tasks in *Exposing the news* are referenced to the NSW *Quality Teaching* model of pedagogy. Some of these activities involve analysis, synthesis, creativity and the incorporation of higher-order thinking skills, for example, and these activities are suitable for gifted students to complete alongside their peers. There is also a number of tasks, such as spelling, that would not provide the requisite challenge in pace or complexity for gifted English students. The strategies provided here include suggestions for appropriately differentiated tasks that could be substituted for or augment the referenced items in the original unit of work.

Outcomes

- Outcome 1, Content point 5: students learn to respond to texts from different reading positions as an aspect of their developing moral and ethical stances on issues
- Outcome 7, Content point 6: students learn to propose, support and elaborate points in an argument and draw conclusions
- Outcome 7, Content point 9: students learn about the ways bias, stereotypes, perspectives and ideologies are constructed in texts, including the codes and phrasings that signal them
- Outcome 8, Content point 4: students learn to track and explain the treatment of a common theme or idea in a range of texts in different modes and media
- Outcome 9, Content point 2: students learn to relate the content and ideas in texts to the world beyond the texts.

Table 19: Example of lesson plan in Stage 4 English

Outcome	Content	Activity
Students respond to and compose increasingly sophisticated and sustained texts for understanding, interpretation, critical analysis and pleasure.	Students learn to apply the information process (NSW Department of Education, 1989) to locate relevant Internet site, locate information, make judgements and draw conclusions about apparent contradictions based on prior knowledge (of ethics in journalism). Students learn about the ways bias, perspectives and ideologies are constructed in texts.	Students locate then read the Wendt article online and mindmap instances of contradictions between realities in journalism and the ideal.
Students think critically and interpretively using information, ideas and increasingly complex arguments to respond to and compose texts in a range of contexts.	Compose and deliver a sophisticated and sustained argument. Experiment with ways of representing the real world imaginatively.	In a short oral presentation students present an analysis of the paradox: Integrity gets in the way of a good story.
Students investigate relationships between and among texts.	Analyse and make connections between context and issues. Recognise similarities or differences of approach, attitude, intent, point of view and perspective by different composers. Demonstrate an understanding of the ways texts reflect personal and public worlds.	Students choose a topic and mode of delivery in research on the following: 1. Australia is promoted as the clever country. Does the media support this in its reporting? 2. How does the media contribute to the Australian habit of cutting down our tall poppies?
Students demonstrate understanding of the ways in which texts reflect personal and public worlds. Students work well with others.	Appropriately select medium of communication. Evaluate and draw conclusions regarding context, significance and priority of items. Demonstrate own emerging sense of style in composing texts. Demonstrate features of increasingly complex imaginative, factual and critical texts, including cognitive, emotional and moral dimensions of the text and its linguistic and structural features.	In small groups students prepare a news bulletin for a teenage audience.

Assessment

Pre-testing will establish the level at which students will need to be introduced to the differentiated activities. These can be done both formally and informally.

Feedback to students may be provided orally during class work, or in writing in response to individual written work. Students should be encouraged to reflect on their learning through continued discussions and communication with the teacher and, in the case of groups, work with their peers. All criteria for assessment should be issued to students before they commence any task.

Table 20: Guide to assessment

Formal assessment	Informal assessment
Work portfolios, including written and other media responses, demonstrate prior levels of thinking and skill achievement.	e.g. Mind maps, oral discussions. Guidelines provided for peer assessment of the oral extension activities. Teacher provision of ongoing oral feedback concurrent with class activity. Student self-reflection.

The unit *Exposing the news* was developed by Richmond River High School and is available under Teaching resources at
http://www.curriculumsupport.nsw.edu.au/english/index.cfm

The complete version of this extension task applying the Williams model is available at
http://www.curriculumsupport.nsw.edu.au/gats/index.cfm

No. 9. Sample unit: Stage 3 English: Fantasy literature

Context

This unit has been developed for opportunity classes in Years 5 and 6 by Illaroo Road Public School. It provides opportunities for gifted students to creatively develop and respond to an understanding of structures and language within the fantasy genre and to relate this learning to their own world.

Outcomes

V6

- *A student chooses to reflect on and share experiences of texts*

RS3.5

- *A student reads independently an extensive range of texts with increasing content demands and responds to themes and issues*

WS3.9

- *A student produces a wide range of well-structured and well-presented literary and factual texts for a wide variety of purposes and audiences using increasingly challenging topics, ideas, issues and written language features*

High fantasy is characterised by a secondary world setting, an "Everyman" protagonist, strong characterisation, a quest, the struggle between good and evil, value-laden events and ideas and an overriding theme concerned with supernatural elements or nonrational phenomena. Paradoxically, good fantasy uses these elements to put readers more closely in touch with reality. Fantasy expresses reality in a way that realistic fiction cannot, through the language of the inner self (Cullinan, 1987).

The novels for this unit are:

McKinley, R. *Spindle's end*	# Paolini, C. *Eragon*
Tolkien, J.R.R. *The hobbit*	# Crossley-Holland, K. *Arthur and the seeing stone*
Kelleher, V. *The red king*	# Caswell, B. *Merryll of the stones* or *Cage of butterflies*
Lewis, C.S. *The lion, the witch and the wardrobe*	# Pullman, P. *The northern lights*, *The subtle knife*, *The amber spyglass* (Pullman's "His dark materials" trilogy
Rodda, E. *Rowan of Rin*	# Jacques, B. The *Redwall* series

Note: Novels marked # must be provided from your own resources. The others are all available in the classroom.

You may choose to include other novels, after negotiation with me. You must read at least TWO of these novels AND complete the following tasks. For each of your chosen works, use your English workbook to answer at least one question in each category of "Plot", "Themes" and "Characters" from the individual set tasks. Answers must be a minimum of a page, and be checked for spelling and punctuation.

Individual set tasks	Plot	Character	Themes
Application	Do problems in the story resemble problems in your own life? How? Why? Write at least a page in the form of a letter to a character exploring the similarities.	Do characters in the story learn things about life which are true and important? What are they?	Did anything in this story really make you think? Why? Explain the theme/s of the story. Are there similarities in theme between the two novels?
Analysis	What stages of development does the protagonist go through? Explain with examples. You could draw a story map for each novel to answer this question.	Are there different types of characters? Describe what makes them different. Create a matrix or table of the types of characters in each novel.	Are there several points of view in the story? Which do you find most persuasive and why?
Synthesis	Does the story remind you of other stories you have read? How and why? Write a review of the story or stories for a journal devoted to fantasy literature.	Is there a character in the story who could be removed without affecting the plot? Why? Why not? Write a scene from the book without this character to demonstrate how this would or would not work.	Think about the nature of the fantasy genre. Create a poster explaining features of the genre using examples from the two novels. You may word process your writing to help your poster presentation.
Evaluation	Is the plot believable? Should it be? In a format of your choice present an interview with the author/s discussing this issue.	Who was your favourite character? Why? Write an obituary for this character, to be run in *The Sydney Morning Herald*.	Is the story well written? Explain your view with reference to quotes from the text to support your argument.
Divergence	If you were the author, what changes would you make to the story? Rewrite a crucial scene with your changes. Justify your changes.	Is there anything about any of the characters you would change? Why? Rewrite a scene demonstrating and explaining your change.	How else could the book/s have ended? Write an alternative ending. Justify why you would make this change.
Intuition	What images are strongest in your mind when you remember the story? Use some of the strongest images from the book/s to create a poem about the work.	Was your first impression of the personality of the protagonist correct? Why/ why not? Write an interview with the character, discussing his/her changing role.	You have recently read a letter sent to the editor of a daily newspaper that condemned fantasy books as phony, unnecessary and trivial. Write a response to this letter, justifying or defending the value of this genre.
Emotion	Do all fantasy stories involve a hero quest? Compare examples from at least two different works.	Choose one of the main characters and describe the main problems he or she faced. To what degree were these problems the individual's fault and to what degree were these problems imposed by outside influences?	Did you laugh or cry? What was your emotional response to the work? Explain which places and events in the story/stories had most emotional impact for you, and why. What techniques did the writer use to influence you emotionally?
Ethics	Are any of the characters placed in a situation in which it is difficult to know what is wrong and what is right? Which situations? What does this contribute to the story/stories? Write a diary entry from the character debating this uncertainty.	Have any of the characters shown any moral courage? Is this novel a personal quest for moral identity, or the quest of a whole community for identity through adherence to similar ideas or nationhood? Write a two minute speech to be presented to the class about the ethical issues for the characters..	How do the characters in the story decide what is right? Choose an event or conflict from one of the books you have read, dealing with the issue of choice. Present it as a news item in a daily paper or in a news report in which you aim to influence the audience's viewpoint.
Aesthetics	How do colours, sounds and other sensations contribute to the power of certain scenes in the story/ stories? Create an artwork (in your choice of medium) exploring the power of those images/ideas. You may choose to work outside naturalistic constraints.	Who was the most "colourful" character in the story? Why? Use the idea of colour to create a portrait of this character, then write an explanation of your choices.	Would you describe any of the scenes as particularly beautiful or ugly? Why? You are part of a production team making a film about one of your chosen books. Create a set of costume drawings, scenery or setting designs, and a poster advertising your film, with your chosen actors in the main roles. Justify your choice.

Objectives here embrace key tenets in differentiation of the curriculum for gifted students, by engaging them in a unit of work where higher-order thinking incorporates the comparing and contrasting of abstract concepts within the genre. Flexibility in task direction and complexity in creative approaches to problem-solving provide a pace that is commensurate with the abilities of gifted students.

More examples of programs and units of work will be progressively uploaded to the Gifted and Talented web pages at
http://curriculumsupport.nsw.edu.au/gats/index.cfm

Environmental conditions

Environmental conditions are also important for enabling gifted students to maximise learning. Teachers of the gifted devote less time to instruction and more time to questioning. They tend to ask many divergent questions and use questions to stimulate discussions and to understand thought processes. Most teachers rely heavily on feedback, but some teachers of the gifted avoid doing this. They behave like counsellors: attentive and interested but not judgemental. This stimulates self-evaluation and reduces dependency on teacher reinforcement. Teachers of the gifted also control the classroom differently, using humour, non-verbal cues and unobtrusive ways of refocusing students' attention on tasks. There seems to be more equality among gifted students and teachers than among the general school population (Silverman, 1988).

Evaluation: A reflection tool for planning programs

Following is a list of questions to consider when evaluating a program for gifted learners.

1. Have you determined the outcomes to be achieved, incorporating those that are both content- and skill-based? As a result of the experiences outlined in the program what will students:
   - learn?
   - understand?
   - be able to do?
2. Have you prepared a task to assess what students already know and can do? What skills and understandings do students already have?
3. Do the differentiated activities focus on one or very few key concepts and generalisations? Do they:
   - take into account individual ability profiles within a class?
   - incorporate higher-level thinking?
   - provide conceptually challenging experiences?
   - promote critical and creative thinking?
   - have meaning and interest for students?
   - provide student choice within the parameters required for focus and growth?
   - communicate high expectations to students?
   - provide explicit assessment criteria for tasks?
   - have a mechanism and plan for providing meaningful feedback to students during and at the conclusion of the activities?
4. Have the following strategies been planned to enhance student learning:
   - group work designed for able learners
   - compacting the curriculum
   - contracts
   - independent study
   - online learning
   - use of learning centres?
5. Have assignments been planned to cater for the abilities of all students in the class? Do the assignments:
   - require all students to use key concepts, generalisations, ideas, problem-solving skills to create meaningful products?
   - include a core of clearly delineated and appropriately challenging expectations for the content of the product e.g. demonstration of understandings and skills, technology/resources to be used?
   - incorporate the processes used in production (defining, locating, selecting, organising, presenting and assessing)?
   - provide for additional criteria for success to be added by the student or the teacher for individual students?
   - plan for ongoing evaluation and modification of the product?
   - plan for the final product to be evaluated by teacher, students, peers and a "real" audience based on evaluation criteria?
   - inform and involve parents as appropriate?

Evaluation of a unit

This is a short series of questions that could be used to evaluate a program, to determine if it caters for all students, and in particular, the gifted and talented.

Rate each component 1–5, with 5 excellent, 3 good, and 1 poor. Comment on or justify your ratings.

Title of unit

(please circle)

1. Deals with major themes, issues, ideas, problems, concepts? 5 4 3 2 1

_____

_____

2. Provides for knowledge or information base? 5 4 3 2 1

_____

_____

3. Interdisciplinary? 5 4 3 2 1

_____

_____

4. Research project, independent study opportunities? 5 4 3 2 1

_____

_____

5. Product or presentation expected? 5 4 3 2 1

_____

_____

6. Thinking, research, library skills taught? 5 4 3 2 1

_____

_____

7. Accelerated level, complex, in-depth, faster-paced activities? 5 4 3 2 1

_____

_____

8. Group activities? 5 4 3 2 1

_____

_____

9. Self-direction, self-evaluation expected? 5 4 3 2 1

_____

_____

10. Outcomes well stated and at higher levels? (refer to Bloom's taxonomy, 1956) 5 4 3 2 1

_____

_____

11. Good opportunities for exploration of individual interests? 5 4 3 2 1

_____

_____

12. Good resources listed? 5 4 3 2 1

_____

_____

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Appendix A

What should be included in a school policy?

- Policy rationale and aims
- Definitions of giftedness and talent
- Principles and procedures for identification
- Staff development program
- Provision
    - Within-class programs and strategies:
        - differentiated curriculum
        - teaching/learning activities
        - grouping practices
        - contracts/independent projects
        - role of assessment – formative and summative
    - Activities beyond the classroom:
        - specialist activities
        - mentor activities
        - collaboration with outside agencies
- Accelerated progression
- Organisational issues
    - management of gifted and talented programs in the school
    - composition of school committee
    - gifted and talented co-ordinator
    - KLA responsibilities
    - role of learning support team
    - Other?
- Transition and transfer
- Resources
- Monitoring and evaluation

Key Learning Area (KLA) level

KLA policies should be developed to complement the school-level policy and should reflect the Department's approach to teaching and learning. KLA policies outline the identification process and the opportunities that are provided for gifted students in their subject area.

Appendix B

Possible goals of a gifted program

Goals

To provide an educational environment to enable highly able students to develop to full potential

To provide qualitatively not quantitatively different programs that provide for the intellectual, psychological and social needs of gifted children.

Objectives of a Year 7 gifted program:

1. To provide for the mastery of the basic skills of English and Mathematics at a pace and depth appropriate to the capacities of able learners.
2. To develop high-level written and oral skills.
3. To develop and apply sophisticated research skills and methods.
4. To provide an environment that encourages divergent thinking. Students will be encouraged in the development of originality, fluency, flexibility and elaboration in their processes.
5. To promote a multi–disciplinary approach to studies that more adequately caters for the learning styles of able children.
6. To promote critical thinking and reasoning abilities e.g.inference, deductive and inductive reasoning, analogies and evaluation of arguments.
7. To provide a social environment which is conducive to the development of compatible relationships and a favourable learning environment.
8. To develop self understanding and provide support for able children.
9. To provide enrichment which is tailored to the needs of able children and suited to their interests – to expand their knowledge base.
10. To provide appropriate opportunities for small-group discussions with students of like ability and for independent investigations.